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10/596,602	06/19/2006	Rainer Hainberger	1826.1183	8349

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EXAMINER	
SMITH, CHAD	

ART UNIT	PAPER NUMBER
2874	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,602	HAINBERGER ET AL.	
	Examiner	Art Unit	
	Chad H. Smith	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *3,5 and 11-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/19/06,5/09/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 3 is objected to because of the following informalities: There is no antecedent basis for the trough-port, and trough is being interpreted to read through, and therefore should read -a through-port-. Appropriate correction is required.

Claim 5 is objected to because of the following informalities: demultiplaxing should read -demultiplexing-. Appropriate correction is required.

Claim 13 is objected to because of the following informalities: plarization should read -polarization-. Appropriate correction is required.

Allowable Subject Matter

Claims 11 – 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11, the prior art of record, taken alone or in combination, fails to disclose or render obvious ...further comprising an optical switch, wherein the polarization selective unit is a polarization beam splitter and the monitoring unit, the optical switch is

connected to output ports of the polarization beam splitter, and the monitoring unit includes a tunable wavelength filter connected to the output of the optical switch.

Regarding claim 12, the prior art of record, taken alone or in combination, fails to disclose or render obvious further comprising an optical switch, wherein the polarization selective unit is a polarization beam splitter and the monitoring unit, the optical switch is connected to output ports of the polarization beam splitter, and the monitoring unit includes a wavelength demultiplexer connected to the output of the optical switch.

Regarding claim 13, the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the polarization monitor unit comprises: an optical power divider placed after the polarization-maintaining waveguide component, a wavelength selective unit connected to one port of the optical power divider, a polarization selective unit connected to the wavelength selective unit with its polarization axis aligned to that of a principal axis of polarization of the polarization-maintaining waveguide component, and a monitoring unit connected to the polarization selective unit for optical power detection and providing a feedback signal to the polarization control unit.

Regarding claim 14, the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the wavelength selective unit is a tunable wavelength filter and the polarization selective unit is a polarizer.

Regarding claim 15 the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the wavelength selective unit is a tunable wavelength filter and the polarization selective unit includes a polarization beam splitter and photodiodes connected to the polarization beam splitter.

Regarding claim 16 the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the wavelength selective unit is a wavelength demultiplexer and the polarization selective unit includes a polarization beam splitter connected to output ports of the wavelength demultiplexer and photodiodes connected to the polarization beam splitter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Naito (Japanese Publication # 02024636).

Naito teaches a control apparatus for an adaptive adjustment of the input polarization to a polarization-maintaining waveguide component, comprising: a polarization control unit (1) controlling a polarization state of an input light to the polarization-maintaining waveguide component (3) according to an input signal fed back from an output side of the polarization-maintaining waveguide component so that a polarization of an input light to the polarization maintaining waveguide component matches to a principal axis of polarization of the polarization maintaining waveguide component (this does happen as the optical amplifier would need the polarization to match the principal axis for maximum amplification to occur); a polarization monitor unit monitoring the polarization state at an output of the polarization-maintaining

waveguide component and feeding back a monitoring result to the polarization control unit as the input signal (5) (figure 1 and abstract).

Regarding claim 2, inherently the photodiode would detect the presence or not of an optical signal.

Regarding claim 19, Naito teaches wherein the polarization monitor unit comprises: a power divider unit connected after the polarization maintaining waveguide component (located beneath item 5 in figure 1), and a spectrum monitor unit connected to one of the output ports of the power divider (the photodiode, 5 receive optical power, and therefore detects a spectrum of light), analyzing spectrum of a received light (converts to electrical energy), and generating feedback signal to the polarization control unit (figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of (LaGasse et al. U. S. PGPub. # 2002/0191265).

Naito teaches the control apparatus as previously discussed in claim 1 above, and teaches in figure 1 a light splitting apparatus adjacent to item 5, and the light splitting apparatus being aligned to the polarization-maintaining waveguide component so that the light with the polarization state which matches to the principal axis of the polarization-maintaining waveguide component couples to the through-port of the polarization beam splitter and a light of a drop-port is used for polarization state monitoring, but is silent to the polarization monitor unit comprising a polarization beam splitter. LaGasse et al. teaches a polarized beam splitter for allowing light of a polarization to pass through while reflecting light of another polarization to a detector. (par. 0058). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Naito's control apparatus with LaGasse et al.'s teaching of a polarized beam splitter so as to allow the polarization monitor unit to detect the power of the light signal determining the light signals polarity for proper feedback adjustment.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of LaGasse et al. (U. S. PGPub. # 2002/0191265) and further in view of Nukui (Japanese Publication # 2001356378).

The previous combination teaches the control apparatus of claim 3 as previously discussed above, but is silent to a plurality of polarization control units or a tunable wavelength filter after the polarization beam splitter along a feedback path and each of the plurality of the polarization control units controls a polarization state of the input light for each wavelength based on a feedback signal obtained by detecting a power of a light passing through the tunable wavelength filter. Nukui et al. teaches a plurality of polarization controllers having a feedback and a controller (tunable wavelength filter) for controlling a signal provided to the polarization controllers (par. 0098). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination's control apparatus with Nukui's teaching of a plurality of polarization controllers having a feedback and a controller (tunable wavelength filter) for controlling a signal provided to the polarization controllers so as control unwanted attenuation that may be present in one or more of the plurality of polarization controllers and alleviate a noisy signal.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of (LaGasse et al. U. S. PGPub. # 2002/0191265) and further in view of Pan (U.S. Patent # 6,038,357).

The cited previous combination teaches the control apparatus of claim 3 as previously discussed above, but is silent to wherein a plurality of the polarization control units are provided for an equal number of wavelengths included in the input light, a wavelength demultiplexing unit is provided after the polarization beam splitter along a feedback path and demultiplexing an input light into each wavelength, and each of the plurality of the polarization control units controls a polarization state of the input light for each wavelength based on a feedback signal obtained by detecting each power of lights demultiplexed by the demultiplexing unit. Pan teaches a mux/demux configuration (figs. 1 – 2) that incorporates a polarization controller feedback circuit to optimize the strength of first polarization state signals of a wavelength multiplexed network (col. 4, line 21 – 57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with Pan's teaching of a mux/demux configuration that incorporates a polarization controller feedback circuit to optimize the strength of first polarization state signals of a wavelength multiplexed network.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Law et al. (U.S. Patent # 6,961,129 B2).

Naito teaches the control apparatus of claim 2 as previously discussed above and an optical power divider placed after the polarization-maintaining waveguide component (figure. 1 under item 5), but is silent to a polarization selective unit connected to one port of the optical power divider with its polarization axis aligned to that of a principal axis of polarization of the

polarization-maintaining waveguide component, and a monitoring unit connected to the polarization selective unit for optical power detection and providing a feedback signal to the polarization control unit. Law et al. teaches an optical power divider (24) that branches off part of the optical signal to a polarization selective unit (52) and a monitoring unit (54). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Naito's optical power divider with Law et al.'s teaching of a more complex polarization detection circuit to more accurately detect the and control the polarization of the polarization maintaining waveguide.

Regarding claim 7, Law et al. teaches wherein the polarization selective unit is a polarizer (38) with its through-axis aligned to a desired principal axis of the polarization maintaining waveguide component, and the monitoring unit is a photodiode connected to an output of the polarizer (54) (figure 8).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Law et al. (U.S. Patent # 6,961,129 B2) and further in view of Yee et al. (U.S. Patent # 7,209,660 B1).

The previous combination teaches control apparatus of claim 6 as previously discussed above, and Law et al. teaches wherein the polarization selective unit is a polarizer (38) with its through-axis aligned to a desired principal axis of the polarization maintaining waveguide component, but is silent to the monitoring unit being a tunable wavelength filter. Yee et al.

teaches a tunable wavelength filter for increasing wavelength selectivity (col. 13, lines 3 –5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with Yee et al.'s tunable wavelength filter so as to be able to accurately choose the desired wavelengths of attenuation associated with an a predetermined polarization.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Law et al. (U.S. Patent # 6,961,129 B2) and further in view of Pan (U.S. Patent # 6,038,357).

The previous combination teaches control apparatus of claim 6 as previously discussed above, and Law et al. teaches wherein the polarization selective unit is a polarizer (38) with its through-axis aligned to a desired principal axis of the polarization maintaining waveguide component, but is silent to the monitoring unit is a wavelength demultiplexer connected to an output of the polarizer. Pan teaches in the abstract demultiplexing a polarized multiple wavelength signal arrangement. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with Pan's teaching of demultiplexing a polarized multiple wavelength signal so as to make the previous combination's control apparatus more compact by utilizing a single polarization maintaining waveguide for transmitting multiple wavelengths across it.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Law et al. (U.S. Patent # 6,961,129 B2) and further in view of LaGasse et al. (U. S. PGPub. # 2002/0191265).

The previous combination teaches control apparatus of claim 6 as previously discussed above, but is silent to a polarization beam splitter and the monitoring unit includes two photodiodes connected to two outputs of the polarization beam splitter. LaGasse et al. teaches a polarized beam splitter for allowing light of a polarization to pass through while reflecting light of another polarization to a detector (par. 0058). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combinations control apparatus with LaGasse et al.'s teaching of a polarized beam splitter, as doing so alleviates items 38, 52 and 62 of Law et al. as the polarization beam splitter would take the place of items 30 and 44 making for a more compact apparatus and furthermore, so as to allow the polarization monitor unit to detect the power of the light signal determining the light signals polarity for proper feedback adjustment.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Anderson et al. (U.S. Patent # 6,856,386 B2).

Naito teaches the control apparatus of claim 1 as previously discussed above and an optical power divider (item below item 5 in figure 1), but is silent to a polarimeter. Anderson et al. teaches an inline polarimeter for determining the state of polarization. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the

teachings of Naito's control apparatus with Anderson et al.'s teaching of an inline polarimeter for determining the state of polarization so as to identify the polarization of the polarization controller.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Ramachandran (U.S. Patent # 6,768,824 B2).

Naito teaches the control apparatus of claim 1 as previously discussed above and an optical power divider (item below item 5 in figure 1), but is silent to a tunable wavelength filter connected to one output port of the optical power divider, allowing monitoring one of a plurality of wavelengths, and a polarimeter analyzing the state of polarization and providing a feedback signal to the polarization control unit. Ramachandran teaches a tunable wavelength filter that can work with a polarimeter and a polarization controller for controlling polarization dependent losses (col. 7, lines 6 – 11, 27 – 33, and figure 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Naito's control apparatus with Ramachandran teaching of a tunable wavelength filter that can work with a polarimeter and a polarization controller for controlling polarization dependent losses.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Farber et al. (U.S. Patent # 6,016,213).

Naito teaches the control apparatus of claim 19 as previously discussed above, but is silent to wherein the spectrum monitor unit is an optical spectrum analyzer. Farber et al. teaches

an optical spectrum analyzer for measuring output power at a given wavelength. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Naito's control apparatus with Farber et al.'s teaching of an optical spectrum analyzer as an electric signal from a photodiode (5) sends a voltage signal to the analyzer and the feedback to the polarization control unit verifying visual representation to an experimenter for calibration purposes.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view Yee et al. (U.S. Patent # 7,209,660 B1).

Naito teaches the control apparatus of claim 19 as previously discussed above, but is silent to wherein the spectrum monitor unit includes a wavelength selective filter and a photodiode detecting the power of the light passing through the wavelength selective filter. Yee et al. teaches a tunable wavelength filter for increasing wavelength selectivity (col. 13, lines 3 – 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Naito's control apparatus with Yee et al.'s tunable wavelength filter so as to be able to selectively choose the desired wavelengths of attenuation associated with a predetermined polarization and outputting that selectively attenuated signal onto photodiode (5) for the feedback.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (Japanese Publication # 02024636) in view of Pan (U.S. Patent # 6,038,357).

Naito teaches the control apparatus of claim 19 as previously discussed above, but is silent to wherein a plurality of the polarization control units is provided for each wavelength and a wavelength multiplexed light is inputted to the polarization maintaining waveguide component. Pan teaches a mux/demux configuration (figs. 1 – 2) that incorporates a polarization controller feedback circuit to optimize the strength of first polarization state signals of a wavelength multiplexed network where each polarization controller controls an individual wavelength (col. 3, lines 18 – 43, and col. 4, line 21 – 57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with Pan's teaching of a mux/demux configuration that incorporates a polarization controller feedback circuit to optimize the strength of first polarization state signals of a wavelength multiplexed network and have this multiplexed signal amplified by the optical amplifier (polarization maintaining waveguide) for transmission over long distances.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad H. Smith whose telephone number is (571) 270-1294. The examiner can normally be reached on Monday-Thursday 7:30a.m. - 5:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-270-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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